

**Serial N . 09/857,933**

**Art Unit: 1714**

**DISCUSSION**

Claims 1, 13, 17, 19, 24, 26, 34, 35, 37 and 38 have been amended. Applicants submit that the amendments to the claims do not enter new matter, but are fully supported in the specification and claims as originally filed. Applicants respectfully request favorable consideration of the claims in their amended form in view of the following discussion.

Claims 1 and 12-38 stand rejected under 35 U.S.C. 112 first paragraph as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that inventor(s), at the time the application was filed, had possession of the claimed invention. The Examiner states:

"Claims recite an organic polymer containing at least one group of the general formula I having silanol (Si-OH) functional group, and page 5 of the specification teach a general formula II having silanol (Si-OH) functional group (Si-OR siloxy group) being a building block. Thus, OH group of said general formula II would react with a polyisocyanate when  $n = 2$ , for example, and thus yield a polymer with a silyl group without OH. Thus, an organic polymer containing at least one group of general formula I having silanol (Si-OH) functional group was not described adequately in the specification."

The polymer dispersion in water contains at least one terminal hydroxysilyl (Si-OH) functional group. This is shown in the formula (I). In the formula shown at page 5 the group of the formula (II) does not have a hydroxysilyl group (see page 5, lines 30-36). The connection between the structure of the group shown in formula (I) and the structure shown in formula (II) is shown at page 27 lines 4-7 which state:

"The introduction of alkoxysilyl-bearing compounds into water is generally accompanied by substantially complete hydrolysis of the alkoxysilyl groups to hydroxysilyl groups. Accordingly, the dispersions of the invention no longer contain any, or substantially any, alkoxysilane groups."

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Applicants submit that as shown in the specification, the polymers are prepared utilizing alkoxysilyl group containing materials and when the polymers containing the terminal alkoxysilyl groups are dispersed in water, the alkoxysilyl groups are hydrolyzed to form the hydroxysilyl groups. Applicants respectfully submit that the specification clearly sets out the correct structure and the method for obtaining the dispersion of polymers with the terminal hydroxysilyl groups. Applicants therefore respectfully submit that the dispersion of the polymer in water, due to the hydrolysis of the alkoxysilyl groups, would contain the hydroxysilyl group. Applicants respectfully request that the rejection under 35 USC 112 be reconsidered and withdrawn.

The Examiner states:

"The recited average molecular weight in claim 25 is indefinite in not specifying a particular average molecular weight such as number average molecular weight or weight average molecular weight."

Applicants respectfully request that the rejection be reconsidered and withdrawn.

In the art, unless otherwise stated, the molecular weight of a polyoxyalkylene polyol is shown as a number average molecular weight. The number average molecular weight is derived from the determination of the molecular weight by end group analysis. That is, the number of hydroxyl end groups in the mixture of polymers. Applicants herewith submit copies of pages 239, 243 and 244 from volume 6 of the second edition of Encyclopedia of Polymer Science and Engineering and page 4 from volume 10. On page 243 from volume 6 under Test Methods the reference teaches that the molecular weight is based on the determination of the hydroxyl content of the

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mixture of polymers. Page 4 from volume 10 teaches that end group analysis provides a method for calculating the number average molecular weight. Page 239 and 244 from volume 6 shows lists of molecular weights of polyethylene glycols without any identification whether the molecular weight is number average, weight average or some other molecular weight. Applicants submit that one skilled in the art would consider that the molecular weights presented were number average molecular weight unless otherwise stated. In view of the practices in the art, Applicants respectfully submit that the molecular weight presented in claim 25 is not indefinite.

The Examiner states that the recited formula (III) in claim 35 lacks antecedent basis in claim 1 since formula (I) contains  $-(OH)_3$  and formula (III) contains  $-(OR)_3$  where R is defined as alkyl. Applicants have amended claim 34 to indicate that the organic polymer, before dispersion in water, comprises a silane-terminated polyether prepared by reacting polyether polyol with an alkoxy silane compound. The alkoxy silane compound is set forth in claim 35. Applicants therefore respectfully submit that the alkoxy silane compound reference in claim 34 is the compound set forth in claim 35. Applicants respectfully request that the objection be withdrawn.

Before discussing the rejections over the prior art, Applicants deem it prudent to set forth what they consider to be their invention. Applicants' invention is a polymer dispersion comprising water, at least 60% by weight of the dispersion of an organic polymer containing at least one terminal group of the formula (I) or mixture of polymers and an emulsifying agent. The organic polymer must contain at least one terminal group containing at least a hydroxysilyl group. Applicants do not understand the

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Examiner's comment:

"The Examiner points out that a polymer having silane groups without OH meets the invention. Also, such polymer of the prior art would be hydrolyzed in an aqueous environment."

Applicants submit that as written, claim 1, claim 13 and claim 17 all require that the polymer have at least one terminal hydroxy silyl group.

In addition, the dispersion of the present invention must contain at least 60% by weight of the dispersion of the hydroxysilyl terminated polymer or a mixture of the hydroxysilyl terminated polymer and an additional polymer. In addition, the dispersion of the present invention contains an emulsifying agent. Applicants respectfully submit that the claims as presently amended are patentable over the prior art cited by the Examiner.

Claims 1, 12-14, 16-22, 24-28, 30, 31, 37 and 38 stand rejected under 35 USC 102(b) as anticipated by, or, in the alternative, under 35 USC 103(a) as obvious over Gaa et al. (US4,567,338). Applicants respectfully submit that Gaa et al. neither teach nor suggest the present invention.

Applicants respectfully submit that Gaa et al. is directed to a composition different from the composition of the present invention. Gaa discloses that the polymers useful in the invention must contain the silanol groups pended to the polymer chain to distribute the effect of the hydroxysilyl groups over the entire polymer chain. The hydroxysilyl groups in the Gaa et al. polymer are not terminal groups. Applicants therefore respectfully submit that Gaa et al. would neither teach nor suggest the polymer dispersed of the present invention containing at least one terminal hydroxysilyl

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group.

The Examiner states:

"Gaa et al teach the instant polymer having the recited formula I and a dispersion thereof having a solid content of 60% at col. 28, lines 28-64 and in abstract. " At column 28 lines 62-64, Gaa et al. teach:

"After the inversion point was reached, water was added to obtain a solids content of 60% or less."

The Examiner interprets this sentence as stating that the dispersion contains 60% by weight of the polymer. The sentence particularly relates to example 1 in the table. The table shows that example 1 contains 37% by weight of the polymer. All of the other examples contain between 37% and 40% by weight of the polymer. Applicants submit that a polymer dispersion containing 60% by weight solids or less, would not contain, 60% by weight of the polymer. Applicants invite the Examiner's attention to the description at column 28 which teaches that the dispersion of the polymer contains catalysts, solvent and pH adjusting agent. These would make the content of the polymer far less than 60% by weight of the dispersion.

As presently claimed, the composition of the present invention not only contains the particular polymer having the terminal silanol groups, but in addition contains an emulsifier which would make the solids content of the dispersion of the present invention greater than 60% by weight. Applicants therefore respectfully submit that Gaa et al. neither teaches nor suggest the present invention.

Applicant's invention is based on the unexpected discovery that dispersions containing at least 60% by weight of a particular polymer and an emulsifying agent

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(greater than 60% by weight solids) can be provided. The examples clearly show compositions containing about 74% by weight of a polymer with water and an emulsifying agent. Applicants respectfully submit that Gaa et al. neither teaches nor suggests the present invention.

Claims 1, 12-14, 16-28, 30, 31 and 37 and 38 stand rejected under 35 USC 103(a) as obvious over Gaa et al. alone or in view of Mahdi et al. (US 6,355,127). Applicants respectfully submit that Gaa et al. alone or in view of Mahdi et al. neither teach nor suggests the present invention. As discussed above, Gaa et al. neither teaches nor suggests the water dispersion of a polymer having terminal silanol groups at a polymer concentration of at least 60% by weight of the dispersion.

The deficiencies in Gaa et al. are not cured by a combination with Mahdi et al. Mahdi is directed to a composition which is cross-linkable. The material is moisture sensitive (see column 23 lines 6-12). Applicants respectfully submit that the moisture sensitive nature of the Mahdi et al. composition would teach away from utilizing the composition as a dispersion in water. Applicants therefore respectfully submit that one skilled in the art would not combine the teachings of Mahdi et al. with Gaa et al. to arrive at the composition of the present invention.

Applicants respectfully submit that their invention is based on the discovery that a dispersion containing at least 60% by weight of certain silanol terminated polymers or mixtures of polymers can be prepared by use of an emulsifying agent. Applicants respectfully submit that this was unknown in the art and unexpected. Compositions with high concentrations of the dispersed polymer have advantages over the prior art

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which discloses dispersions containing less than 60% by weight of the polymer.

Applicants respectfully submit that the present invention is neither taught nor suggested by the prior art cited by the Examiner. Applicants respectfully request favorable consideration of the application in its amended form.

Respectfully submitted,



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